ESUS
Technologies GmbH

Coriolis Mass Flowmeter

EsuMass

ESUS-Technologies GmbH

Introduction

EsuMass series Coriolis mass flowmeter is a new generation of intelligent flowmeter developed by our company, which can not only measure the flow of ordinary conductive liquids, but also can be used for the volume flow of pure water and gas–liquid two–phase suspension liquid. Widely used in petroleum,chemical industry, metallurgy, textile, pharmaceutical, food and beverage, paper, electricity, urban water supply and drainage and environmental protection and other fields.

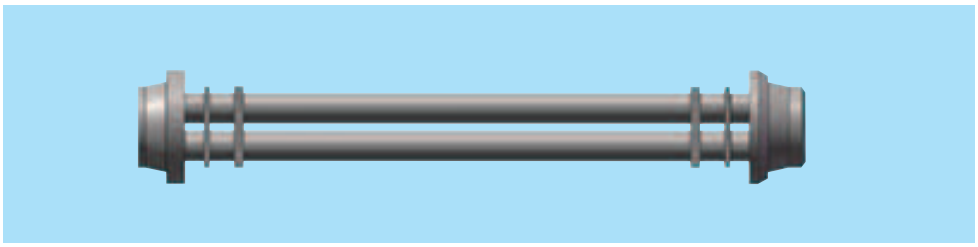
- Full intelligent design, strong anti–interference ability, high measurement accuracy.
- Using imported microprocessor, fast operation speed, high precision, to ensure stable and reliable operation of products.
- High precision components, SMT mounting technology and three layers of insulation protection are used to improve the reliability of the circuit.
- No moving parts in the sensor, free flow parts, long product life, small pressure loss.
- The flow signal is linear to the average flow rate and is not affected by changes in fluid density, viscosity, temperature, pressure and conductivity.
- High definition backlit LCD display displays instantaneous flow, cumulative flow, temperature and density simultaneously.
- With a variety of current signal, pulse signal and frequency signal output. Current output can output parameters such as flow or density as well as temperature.

Principle of measurement

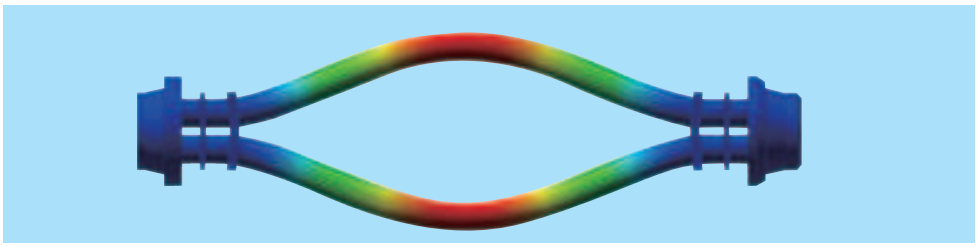
The Coriolis force is the force acting on an object that is simultaneously undergoing linear motion and rotational motion, which is proportional to the vector product of the linear velocity and the angular velocity of the rotational motion.The Coriolis mass flow meter utilizes this principle by using magnets and coil components installed on the measuring tube. The two parallel measuring tubes vibrate at their natural frequency under the influence of alternating current. When fluid flows through the measuring tubes, the Coriolis force causes a phase shift in the vibration of the measuring tubes; the greater the mass flow rate of the fluid, the larger the phase shift of the measuring tubes vibration. By detecting the phase shift of the vibration in the two measuring tubes, the mass flow rate can be obtained.

The vibration frequency of the measuring tubes is determined by the total mass of the measuring tubes and the fluid inside them. When the density of the fluid changes, the vibration frequency of the measuring tubes also changes accordingly, allowing for the density of the fluid inside the tube to be determined.The temperature sensor installed on the measuring tube, in conjunction with the measuring circuit, can obtain the temperature of the fluid in real time.

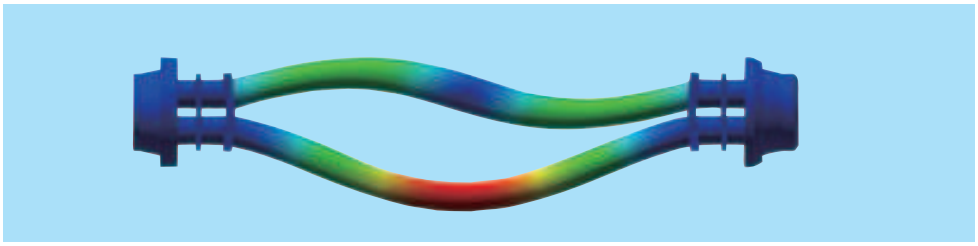
Empty pipe, no vibration



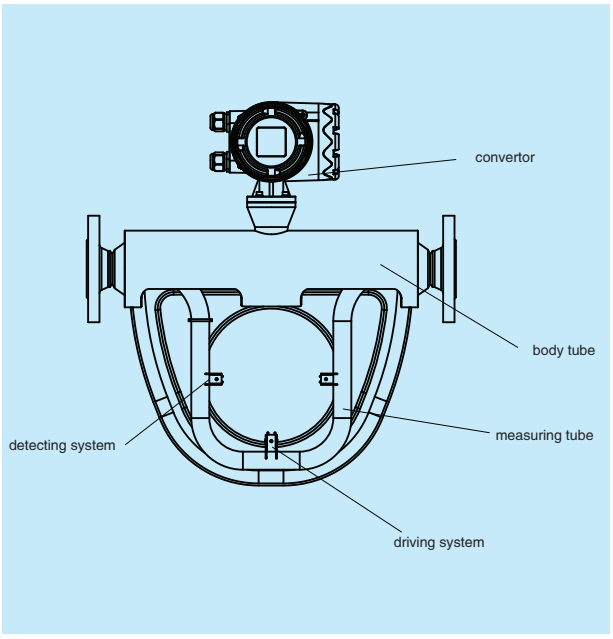
Working condition without flow

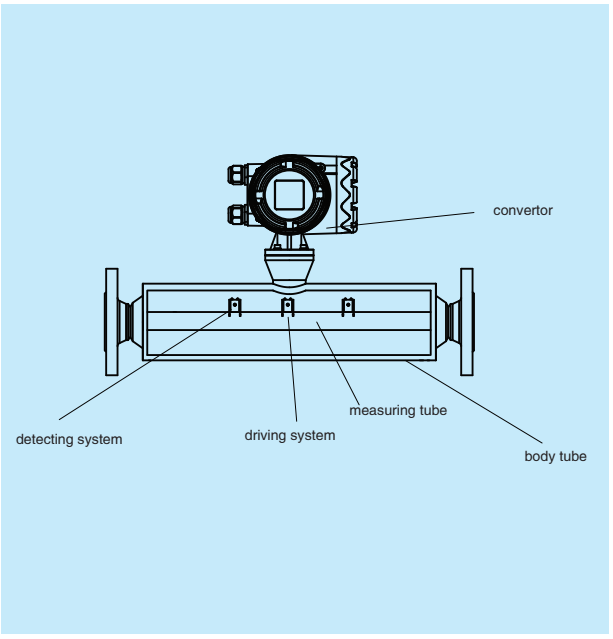


Working condition with flow



Structure drawing





Technical data

The EsuMass transmitter utilizes the most advanced DSP digital signal processing technology and fully digital drive technology, greatly enhancing the stability of flow. The display features a large OLED screen, providing smoother and clearer visuals, and it can maintain stable display performance even at low temperatures. The instrument is capable of real–time self–diagnosis, monitoring various issues in real–time and providing alarms. At the same time, the instrument is equipped with multiple signal interfaces such as current, pulse, and RS485, as well as various functional options to meet different working conditions. It employs a capacitive button design, allowing for convenient operation of the instrument without the need to open the converter's cover.

Display		OLED
Size of display		58x29
Decimal		1,2,3
Display unit	Mass flow	kg/s，kg/m，kg/h，t/s，t/m，t/h
	Mass totalizer flow	kg，t
	Cubic flow	L/s，L/m，L/h，m^3/s，m^3/m，m^3/h
	Cubic totalizer flow	L，m^3
	Density	g/cm^3，g/L，kg/L，kg/m^3
Temp of Environment		–40~65℃
Output	Pulse,frequency	equivalent signal/frequency signal(10KHz)
	4–20mA	Flow signal/density signal/temperature signal
Accuracy of pulse output		0.01%
Accuracy of current output		0.05%
Communication		RS485/HART
Power supply		220VAC/24VDC(universal power supply)
IP		IP67
Explosion grade		Ex d IIC T6 Gb
Product size		181.5x171x141
Weight		1.35Kg

Flow range

S version

Model	DN size (mm)	flow range (kg/h)	zero stability (kg/h)	accuracy
S15	DN15	300~3000	0.20	0.10、0.15 0.20、0.30
S25	DN25	1500 ~ 15000	1.25	
S40	DN40	3500 ~ 35000	3.00	
S50	DN50	5000 ~ 50000	4.00	
S80	DN80	15000 ~ 150000	12.5	
S100	DN100	20000 ~ 200000	17.5	

U version

Model	DN size (mm)	flow range (kg/h)	zero stability (kg/h)	accuracy
U15	DN15	300~3000	0.25	0.10、0.15 0.20、0.30
U25	DN25	800 ~ 8000	0.75	
U40	DN40	3200 ~ 32000	3.00	
U50	DN50	3500 ~ 35000	3.20	

V version

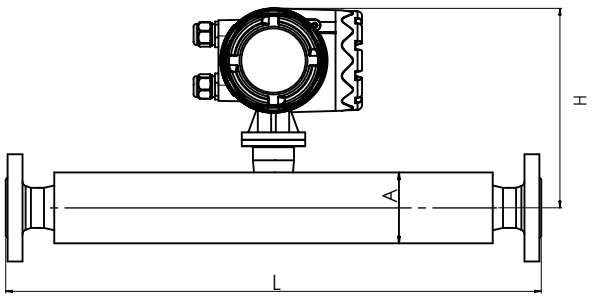
Model	DN size (mm)	flow range (kg/h)	zero stability (kg/h)	accuracy
V15	DN15	300~3000	0.25	0.10、0.15 0.20、0.30
V25	DN25	800 ~ 8000	0.75	
V40	DN40	3200 ~ 32000	3.00	
V50	DN50	3500 ~ 35000	3.20	

ES900S–FA series

KF900S–FA series Coriolis mass flowmeters use flange connection.Widely used in petroleum,chemical industry, metallurgy,textile,pharmaceutical,food and beverage,paper, electricity, urban water supply and drainage and environmental protection and other fields.

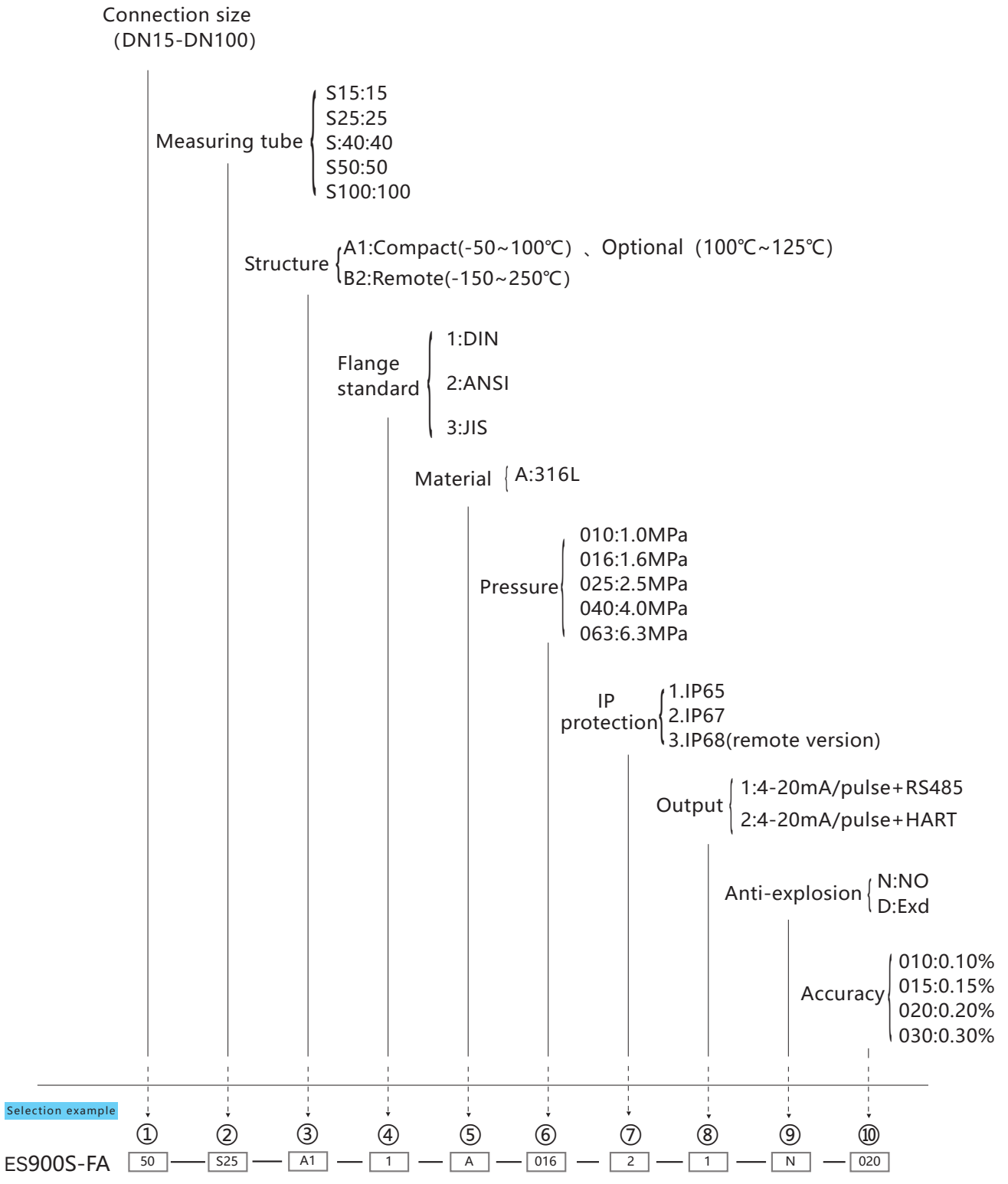
DN size	DN15~DN100
Material	316L
Accuracy	0.1、0.15、0.2、0.3
Velocity	0.3m/s-10m/s
Working Temp	≤100℃ for compact version/optional(100℃~125℃)
Working Pressure	0.6Mpa-4.0Mpa (with different size)
IP	IP65,IP67,IP68(remote)
Output	4-20mA/Frequency/pulse
Power supply	220VAC/24VDC(Universal power)
Installation	Compact
Flange standard	DIN,ANSI,JIS

ES900S–FA Specification



DN size	Pressure	L	A	H
DN15	PN40	498	76	202
DN20		498	76	202
DN25		531	89	214
DN32		531	89	214
DN40		620	114	226
DN50		712	133	236
DN65		712	133	236
DN80		880	168	254
DN100	PN16	1200	190	265

ES900S–F A How to order



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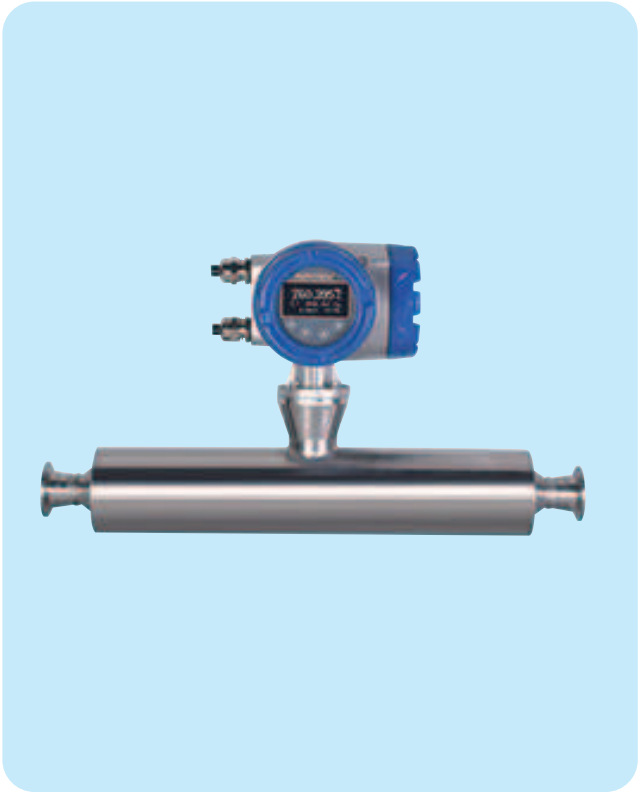
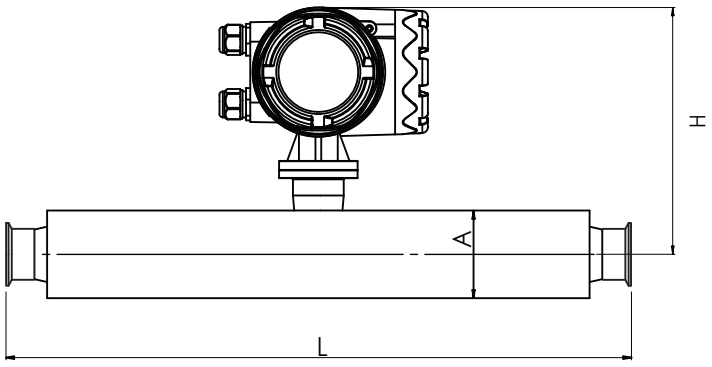
ES900S–KA series sanitary mass flowmeter



900S–KA series Coriolis mass flowmeters use clamp connection. Widely used in petroleum, chemical industry, metallurgy, textile, pharmaceutical, food and beverage, paper, electricity, urban water supply and drainage and environmental protection and other fields.

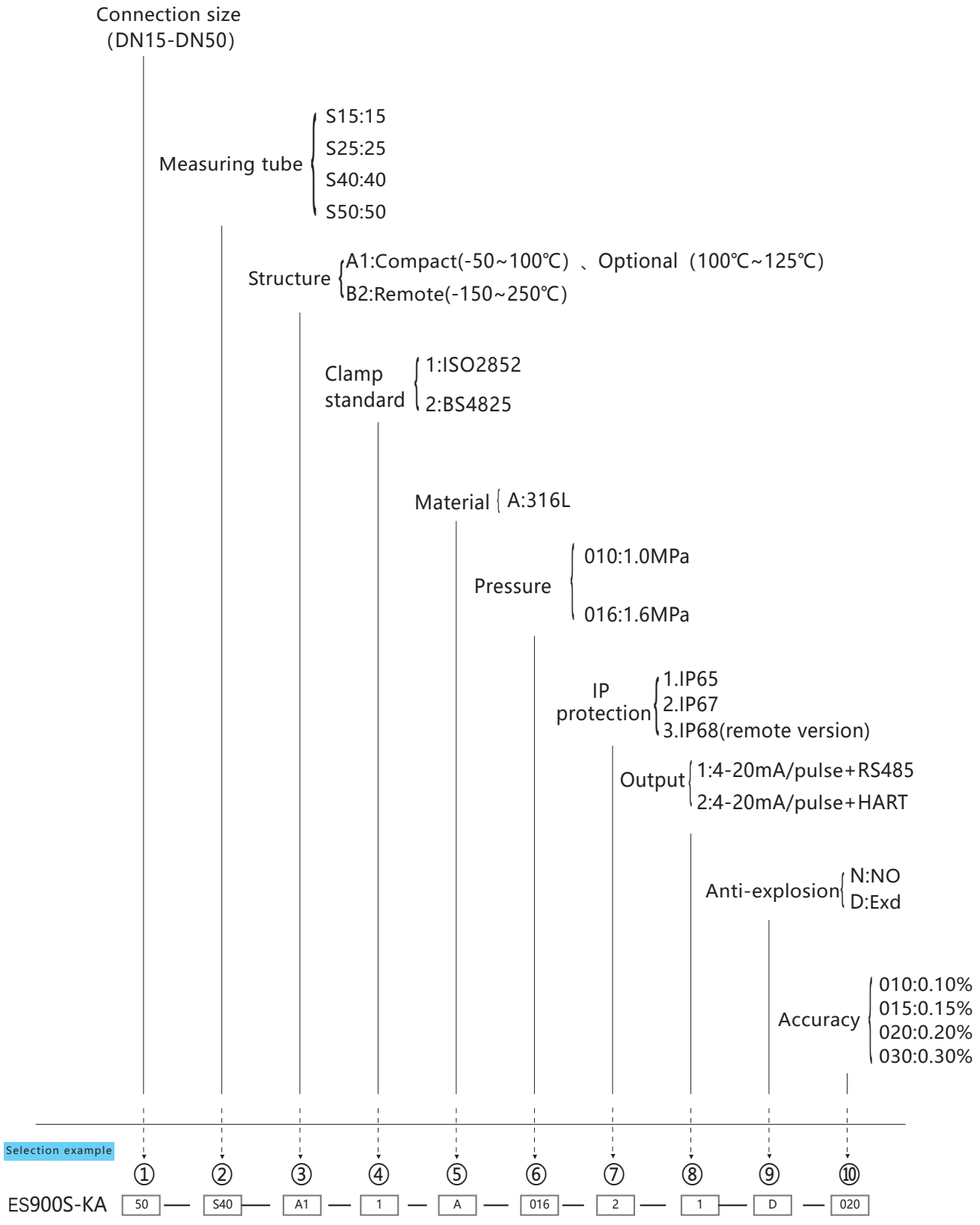
DN size	DN15~DN50
Material	316L
Accuracy	0.1、0.15、0.2、0.3
Veloncity	0.3m/s-10m/s
Working Temp	≤100℃ for compact version/optional(100℃~125℃)
Working Pressure	0.6MPa~4.0MPa (with different size)
IP	IP65, IP67, IP68 (remote)
Output	4~20mA/Frequency/pulse
Power supply	220VAC/24VDC(Universal power)
Installation	Compact
Flange standard	ISO2852,BS4825

ES900S–KA Specification



DN size	Pressure	L	A	H
DN15	PN16	498	76	202
DN20		498	76	202
DN25		531	89	214
DN32		531	89	214
DN40		620	114	226
DN50		712	133	236

ES900S–KA How to order

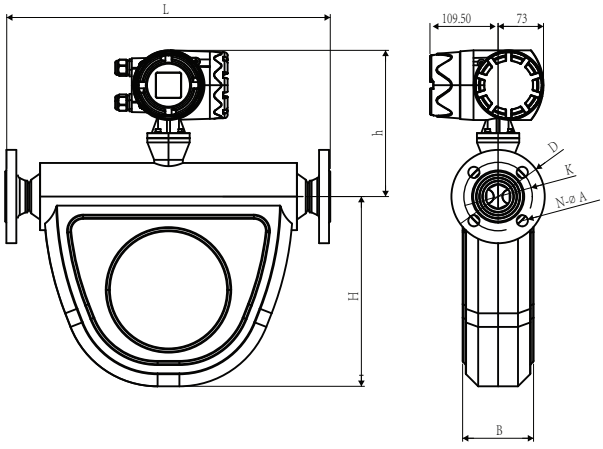


ES900U–FA series

ES900U–FA series Coriolis mass flowmeters use flange connection. Widely used in petroleum,chemical industry, metallurgy, textile, pharmaceutical, food and beverage, paper, electricity, urban water supply and drainag e and environmental protection and other fields.

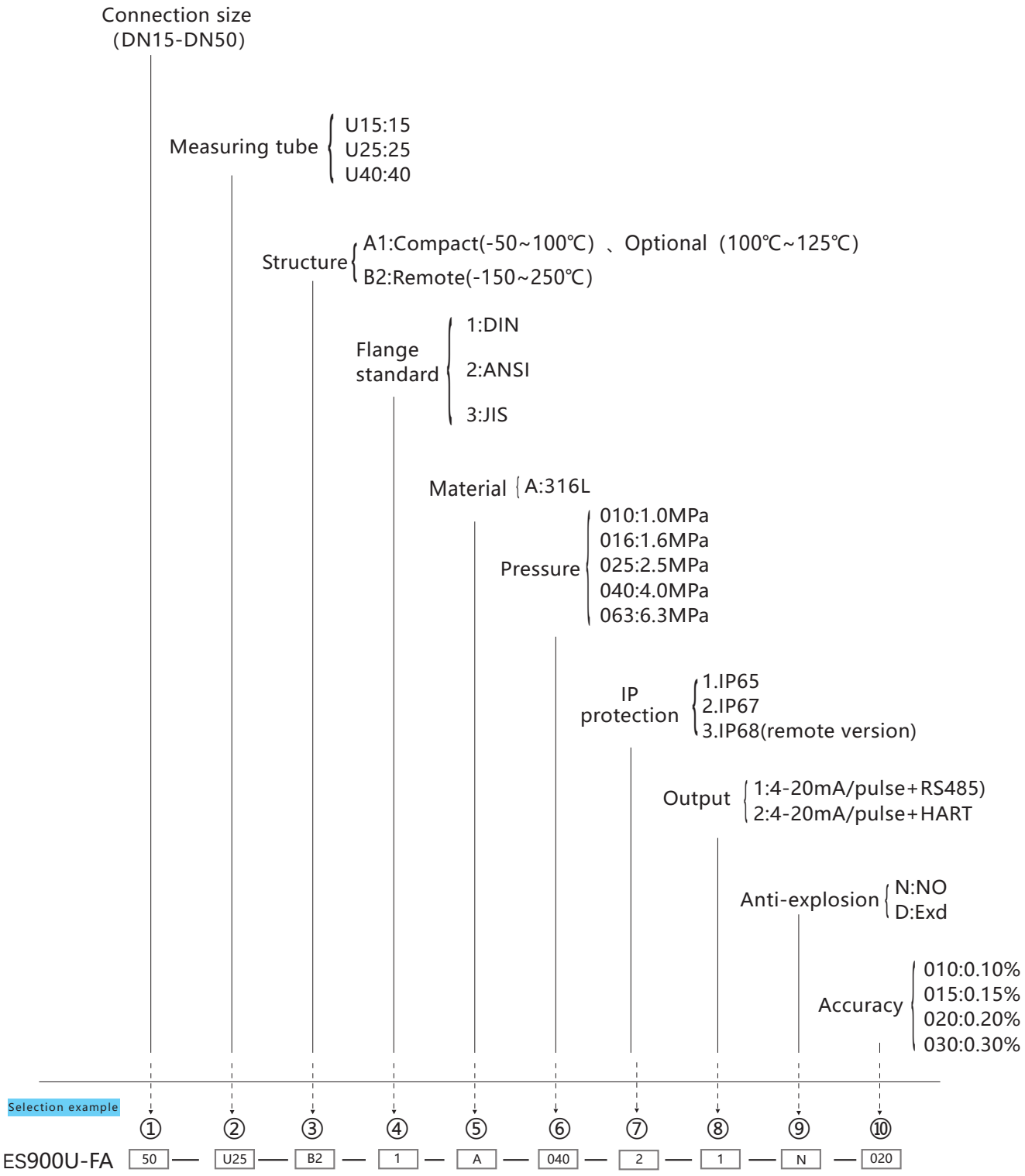
DN size	DN15~DN50
Material	316L
Accuracy	0.1、0.15、0.2、0.3
Velocity	0.3m/s-10m/s
Working Temp	≤100℃ for compact version/optional(100℃~125℃)
Working Pressure	0.6Mpa-4.0Mpa (with different size)
IP	IP65,IP67,IP68(remote)
Output	4-20mA/Frequency/pulse
Power supply	220VAC/24VDC(Universal power)
Installation	Compact
Flange standard	DIN,ANSI,JIS

ES900U–FA Specification



DN size	Pressure	L	D	K	N–ΦA	B	H	h
DN15	PN40	304	95	65	4–14	80	190	202
DN20		330	105	75	4–14	80	190	202
DN25		420	115	85	4–14	90	230	214
DN32		430	140	100	4–18	90	230	214
DN40		520	150	110	4–18	103	303	226
DN50		532	165	125	4–18	103	303	226

ES900U–FA How to order

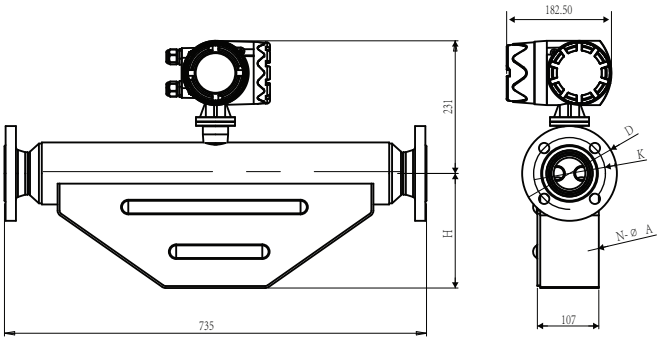


ES900V–FA series

ES900V–FA series Coriolis mass flowmeters use flange connection. Widely used in petroleum, chemical industry, metallurgy, textile, pharmaceutical, food and beverage, paper, electricity, urban water supply and drainage and environmental protection and other fields.

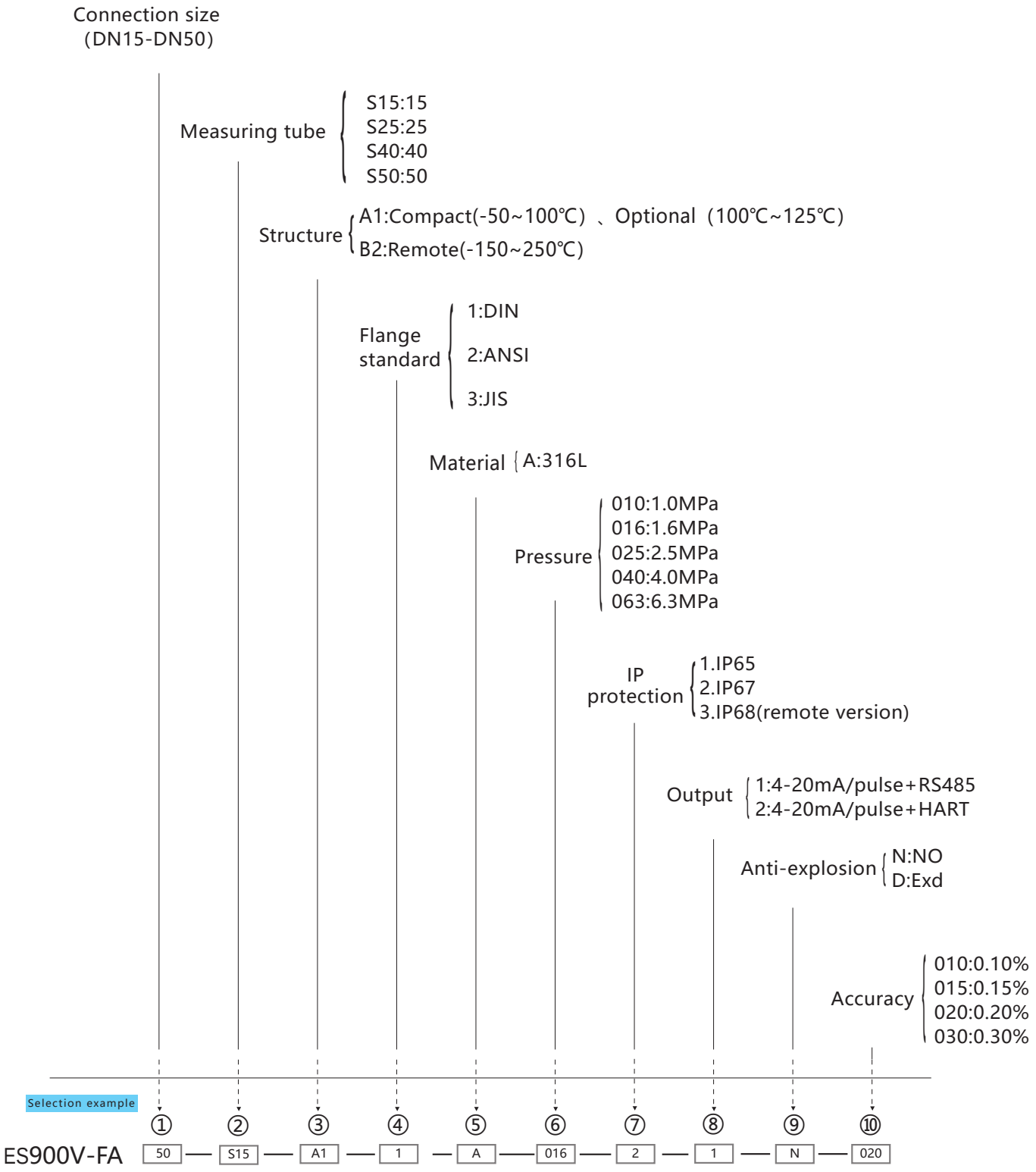
DN size	DN15~DN50
Material	316L
Accuracy	0.1、0.15、0.2、0.3
Velocity	0.3m/s-10m/s
Working Temp	≤100℃ for compact version/optional(100℃~125℃)
Working Pressure	0.6Mpa-4.0Mpa (with different size)
IP	IP65,IP67,IP68(remote)
Output	4-20mA/Frequency/pulse
Power supply	220VAC/24VDC(Universal power)
Installation	Compact
Flange standard	DIN,ANSI,JIS

ES900V–FA Specification



DN size	Pressure	L	D	K	N–ΦA	B	H
DN15	PN40	304	95	65	4–14	80	202
DN20		330	105	75	4–14	80	202
DN25		420	115	85	4–14	90	214
DN32		430	140	100	4–18	90	214
DN40		520	150	110	4–18	103	226
DN50		532	165	125	4–18	103	226

ES900V–F A How to order

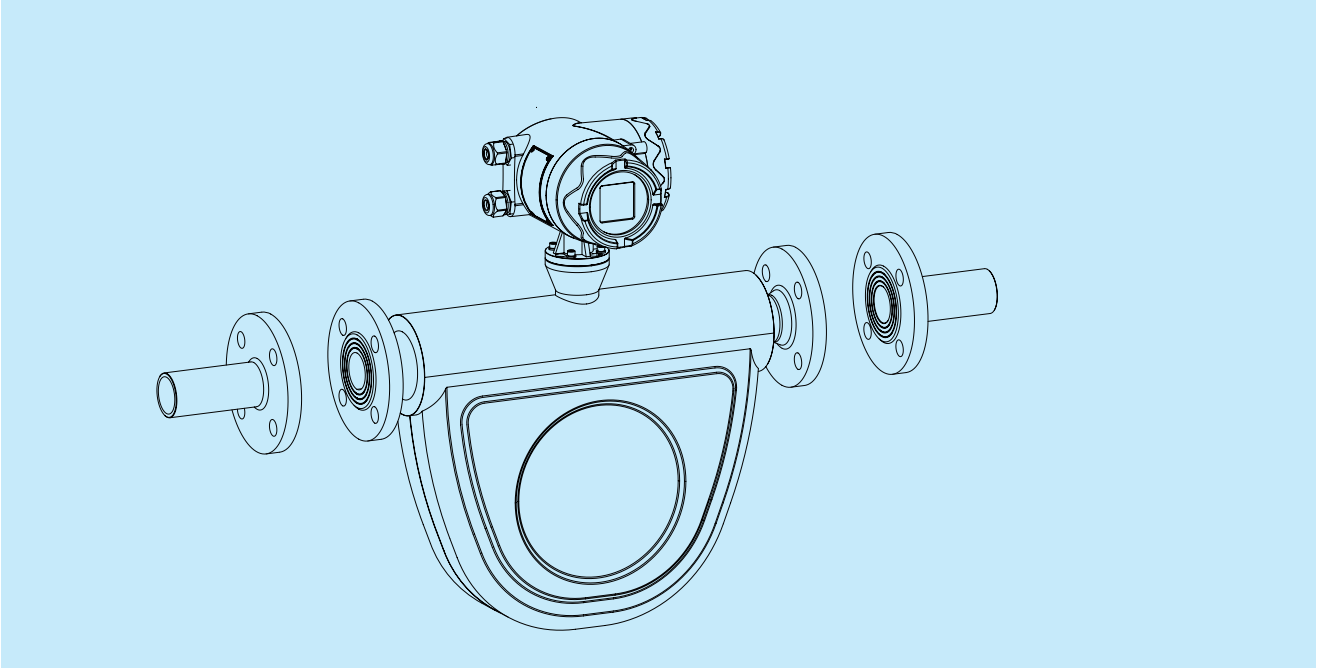


Basic requirements

The lower part of the process pipeline should be selected for installation to ensure that the process medium is filled with sensors during zero calibration and operation.

When installing a flow meter, the torque and bending load on the process connection should be minimized as much as possible. Meanwhile, it is strictly prohibited to use sensors to support pipelines.

When installing a flowmeter in a strong vibration area, a metal braided hose is required to isolate it from the vibration source and provide additional support on the pipeline.



Dangerous area

Before installing the flowmeter in a dangerous area, please confirm that the installation environment of the flowmeter is suitable for the explosion–proof performance indicated on the flowmeter nameplate.

Straight pipe section

Flow meters do not require specialized straight pipe sections upstream and downstream. If two or more mass flow sensors are installed on the same process pipeline, it should be ensured that the length of the process pipeline between any two sensors is longer than 2m.

Flow direction

There is a clear flow direction indicator arrow on the flowmeter. Please install it in the same direction as the flow direction of the process medium and the indicator arrow.

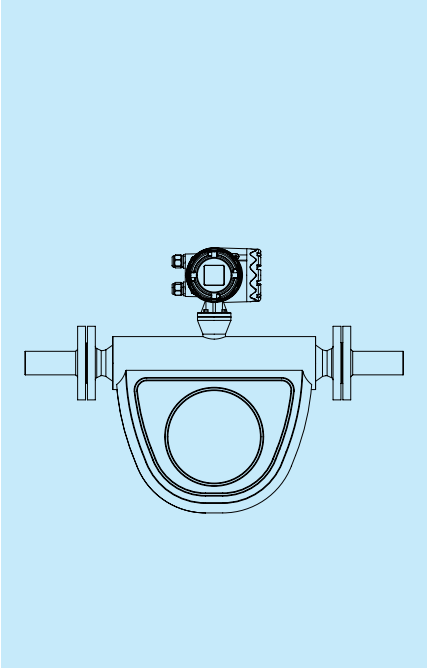
Installation direction

The flowmeter can only work properly when the flow tube is filled with process medium. In principle the flow meter can be installed in any direction to make sure the full process medium in the pipeline.The flow meters are always with correct installation.

If measuring liquid or slurry, the sensor must be installed below the horizontal line.

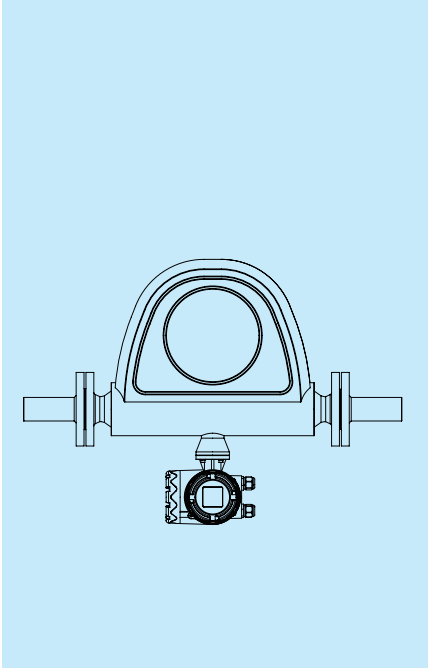
If measuring gas, the sensor must be installed on the horizontal line.

Pay attention when customer meet vertical installation, the flow direction must be from bottom to top for liquid; The flow direction must be from top to bottom for gas.



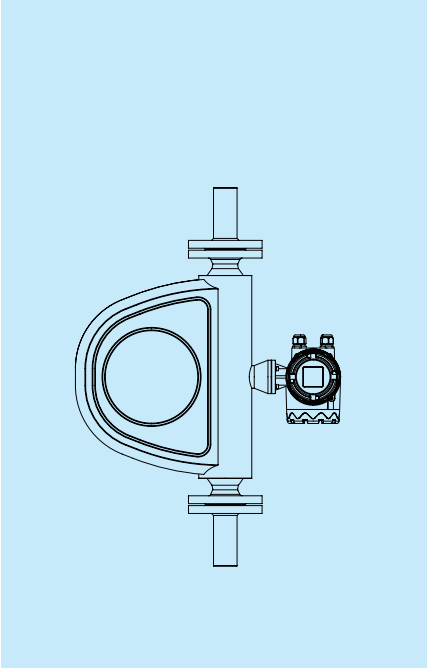
Liquid

Measuring tube below the horizontal line



Gas

Measuring tube on the horizontal line



Liquid or Gas

Measuring tube on the side of the vertical line

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